

# UNITED STATES PATENT OFFICE.

PROSPER MONNET, OF ST. FONS, RHÔNE, FRANCE, ASSIGNOR TO THE SOCIÉTÉ  
P. MONNET ET CIE., OF SAME PLACE.

## OBTAINING BROWN DYES FROM THE AROMATIC DIAMINES.

SPECIFICATION forming part of Letters Patent No. 298,998, dated May 20, 1884.

Application filed January 26, 1884. (No specimens.)

*To all whom it may concern:*

Be it known that I, PROSPER MONNET, a citizen of the French Republic, residing at St. Fons, Rhône, France, have invented a  
5 Process for Producing a Brown Dye on Materials by Direct Oxidation thereon of Aromatic Diamines or their Salts, of which the following is a specification.

My invention relates to a method of dyeing  
10 materials brown with the aid of aromatic diamines, and especially those having the prefix "para," or their salts, such as chlorhydrate of paraphenylene diamine and paratoluylene diamine. With these I am enabled by direct  
15 oxidation on the fiber or fabrics to produce a magnificent solid brown dye, varying in tint from cinnamon brown to a very dark brown.

In carrying out my invention I proceed as follows: Among all the salts of the diamines  
20 I prefer for my purpose the chlorhydrate of paraphenylene diamine, partly because of its comparative cheapness, and partly because of the beauty of the shades of color obtained. The materials to be dyed are first submitted  
25 to the usual treatment, according to their nature, to adapt them to receive dyes of any kind whatever. These are then placed in a bath more or less concentrated, according to the results to be obtained, but ordinarily composed as follows: Three hundred grams of  
30 chlorhydrate of paraphenylene diamine are added to fifty grams of sulphuric acid at 66° Baumé, and this is diluted with one hundred liters of water. The material to be dyed is  
35 placed in this bath and allowed to remain long enough to become thoroughly impregnated with the solution. It may then be removed and the excess of liquid removed by wringing. The material may be previously mordanted or  
40 not, according to its nature. Cotton, either in fabric or raw, should be mordanted with sumac in the usual way to obtain very deep shades. I now employ an oxidizing-bath formed either of chlorate of potassa and a small  
45 quantity of salts of vanadium, or a solution of bichromate of potassa, or any other oxidizing-bath. The chlorate-of-potassa bath is employed when I wish to develop the color slowly with the aid of moist air. The bath of chro-  
50 mate develops the color more rapidly, especially when heated. This bath is usually made with five hundred grams bichromate of

potassa in one hundred liters of water. The textile material impregnated with the solution of salt of diamine is placed in the ox- 55 idizing-bath, which is maintained at any suitable temperature. The color develops immediately, and by successive immersions first in the diamine bath and then in the developing-bath, and when necessary the exposure to the 60 air between immersions, the shade or tint deepens more and more until the proper depth is obtained. The dyed material may then be rinsed and dried or treated with other preparations, according to their nature, as will be 65 well understood.

For printing on fabrics I employ a concentrated solution of chlorhydrate of paraphenylene diamine added to the thickening or mucilaginous vehicle while cold, together with 70 the necessary quantity of chlorate of potassa to develop the dye, and some traces of salts of vanadium. The color develops to its maximum in moist air. The fabric is afterward dried and treated in the usual way. 75

I am able to dye by my method all fibrous and textile materials—such as cotton, wool, silks, hair, paper, &c.—either in fabric or fiber.

I am aware that it is not new to produce a 80 blue dye-stuff or pigment by the action of diethylparaphenylene-diamine chloride upon an alkaline solution of phenol, nor to produce a purple dye-stuff from thiodiphenylamine. This has been done before, and the methods 85 employed differ both in result and kind from my method.

Having thus described my invention, I claim—

The herein-described method of dyeing ma- 90 terials brown, which consists in saturating the material in a bath composed of chlorhydrate of paraphenylene diamine, or its specified equivalent, sulphuric acid, and water, then wringing, and then treating the material to 95 an oxidizing-bath for developing the color, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PROSPER MONNET.

Witnesses:

JEAN P. A. MARTIN,  
CLÉMENT ROLAND.